

**Levels of voluntary disclosure in IPO prospectuses:
An empirical analysis**

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ABSTRACT

Levels of voluntary disclosure in IPO prospectuses: an empirical analysis

This paper focuses on *how* forecasts information is disclosed in IPO prospectuses. In France, managers report either detailed forecasts or only a brief summary. We investigate the determinants and consequences of the varying levels of detail provided in these forecasts. Based on a sample of 82 IPOs on the Euronext Paris market (2000-2002), we show that only two variables are associated with highly detailed forecast disclosures: forecast horizon and firm age. We also find that the forecast error decreases as the level of detail in the forecast disclosures increases. This finding is robust to our reverse causality test (Heckman two-stage self-selection procedure) and suggests that the level of detail in forecast disclosures enhances the reliability of earnings forecasts.

KEYWORDS: IPO, FORECAST DISCLOSURE, FORECAST ERROR

RÉSUMÉ

Niveaux de publication dans les prospectus d'introduction; une étude empirique

Cet article étudie le mode de publication des informations prévisionnelles (IP) dans le prospectus d'introduction. A partir de l'étude de 82 prospectus sur le Euronext-Paris entre 2000 et 2002, nous observons que les entreprises choisissent de publier des IP soit de manière très synthétique (présentation d'indicateurs clefs), soit de manière très détaillée (états financiers complets prévisionnels, discussion des hypothèses...). Nous étudions les déterminants de ces deux niveaux de publication et leur association avec l'erreur de prévision du résultat futur. Nous trouvons que seuls l'âge de la firme et l'horizon de prévision sont associé avec IP détaillée. De manière plus importante, l'erreur de prévision décroît avec le niveau de détail des IP. Ce résultat est robuste à nos tests de causalité inversée et suggère que la fiabilité des prévisions de résultat croît avec le niveau de détail de l'IP.

MOTS-CLEFS : INTRODUCTION EN BOURSE, PUBLICATION VOLONTAIRE, ERREUR DE PREVISION

I. Introduction

Significant information asymmetry between the issuing firm's management and potential shareholders is a characteristic feature of IPOs. On one side of the divide, managers have private information on the future performance of the firm. On the other, potential investors have access to little or no information on the firm, since pre-flotation disclosure requirements are limited. To attenuate this asymmetry, management can make disclosures of information in the IPO prospectuses. Disclosures may be allowed, required or forbidden depending on the national laws. In the USA, for instance, an IPO prospectus cannot contain any forecast figures, in order to protect the firm against any lawsuits on the grounds it has failed to live up to expectations (Clarkson et al. 1991). The inclusion of forecast disclosures in IPO prospectuses is an interesting feature of the French market.

This French specificity (shared with Australia, New Zealand and Hong Kong) makes it possible to study the determinants and effects of forecast disclosures in a high information asymmetry environment where earnings forecasts are particularly important for shareholders: IPOs. France's financial regulator, the AMF (*Autorité des Marchés Financiers* – Financial Market Authority) requires firms undertaking IPOs on the *Nouveau Marché* to produce forecast financial statements over a three-year timeframe. But there are no such requirements for firms that choose the *Second marché* for their IPO. Since the *Second marché* attracts mainly relatively large and well-known firms, the information asymmetry between managers and potential investors is less significant than on the *Nouveau marché* which is preferred by new firms, mainly from the high tech sector. However, all firms during the period 2000-2002 undertaking flotations on the *Second marché* disclosed financial forecasts.

While all sample firms involved in IPOs on both the *Nouveau marché* and the *Second marché* disclosed forecasts, there is considerable variance in the way information is disclosed. Managers can provide private information in many ways: their forecasts can be very detailed, presenting a full set of financial statements and a description of their assumptions. Alternatively, their forecasts can be very brief, simply a table with key indicators. This point is important because detailed forecasts reduce the information asymmetry between the management of the firm undertaking the IPO and its potential investors (Lev 1992), but has gone largely unstudied because most developed countries' regulatory bodies will not allow or do not require firms undertaking IPOs to publish earnings forecasts. Past research (e.g. Mak 1996) has concentrated on the determinants and effects of disclosure versus non-disclosure of business forecasts. In this study, because all the firms in our sample disclosed financial forecasts, we focus not on forecast disclosures versus non-forecast disclosures, but on *how* forecast information is disclosed.

The main purpose of this study is to examine the determinants and consequences of the level of detail in forecast disclosures published at the time of IPOs. The study comprises two stages. Our first aim is to understand the determinants of the level of detail in the forecast disclosures. The second is to examine the influence of the level of detail in forecast financial statements on forecast error. Without exception, French firms publish earnings forecasts for the post-IPO years in their prospectus. The aim is to determine whether the forecast error, i.e. the difference between actual reported earnings and the expected earnings, is affected by the level of detail in the forecast financial statements. And since the publication of forecasts involves disclosure of earnings forecasts, it will also be useful to analyse the impact of the detail level on future earnings forecast errors. Previous research has shown that firms underperform in the long term following their initial flotation on the stock market (Degeorge and Derrien 2001). This underperformance can be attributed to over-optimism on the part of investors regarding future

earnings. The identification of factors that encourage management to publish reliable earnings forecasts is thus valuable, because it contributes to market efficiency by curbing one of the sources of underperformance in respect of shares issued following IPOs.

Our study differs from previous literature on earnings forecast disclosure in several respects. First, prior research has generally focused on forecasts disclosed by already-listed firms (e.g., Imhoff 1978; Waymire, 1984; Pownall and Waymire 1989; Ruland et al. 1990), while we focus on earnings forecast disclosure by IPO firms in their prospectuses. There is little empirical evidence on the factors associated with the disclosure of earnings forecast information in an IPO context, except Mak (1996). Second, previous studies on earnings forecast disclosure have mainly been carried out in the United States (e.g. Jaggi and Grier 1980; Ruland et al. 1990), where disclosure costs are high (Clarkson and Simunic 1994, p. 211). In that type of environment, forecast disclosure may be significantly affected by supply-side cost factors. This study instead examines forecast disclosure in France, where disclosure costs are likely to be lower, and accordingly forecast disclosure may be driven more strongly by the benefits it brings. Third, while previous research has tended to distinguish between forecasting and non-forecasting firms (e.g., Jaggi and Grier 1980; Ruland et al. 1990), this study distinguishes between different levels of detail in disclosure of earnings forecasts.

Our research also differs from previous studies on earnings forecast disclosure at the time of IPOs. To the best of our knowledge, only Mak (1996) has examined the determinants of forecast disclosure by IPO firms. However, our study differs from Mak (1996) on two important points. First, we examine the *level of detail* of forecast information rather than the disclosure or non-disclosure of forecast information. In other words, we examine the frame used by managers to disclose business forecasts (Do they use prospective balance sheets? Do they present an

assumption section? etc) rather than the disclosure or otherwise of earnings forecasts. Second, we also investigate the relationship between the level of detail in forecast disclosures and the reliability of earnings forecasts, which is not the case in Mak (1996). There is extensive literature on the determinants of management forecast errors at the time of IPOs (Brown et al. 2000, Cheng and Firth 2000, Jelic et al. 1998 among others). Prior papers have concentrated either on the determinants of management forecast accuracy (Jelic et al. 1998) or the forecaster/non forecaster dichotomy and its relationship to future performance (Jaggi and Grier, 1980). However, no existing study has investigated the association between the level of forecast disclosure and earnings forecast error.

We study a sample of 82 IPOs on the Euronextⁱ Paris market in 2000, 2001 and 2002. We first construct a measure for the level of detail in forecast information. We find that two patterns exist in forecast disclosure: either firms choose to publish very detailed forecast information ('detailed forecasts'), or they just present a summary table ('basic estimates'). We first tried to explore the determinants of this level of detail. Our theoretical framework derives from agency and signalling theories. Results show that the only significant determinants are: the forecast horizon and the firm age. We then analyse the relation between forecast error and the level of detail in forecast disclosures. Our prediction is that the forecast error should decrease with the level of detail in forecast disclosures. This hypothesis is backed by our empirical data. The negative association between the level of detail in forecast information and forecast errors may either be evidence that detailed information leads to less forecast error, or alternatively it may indicate the existence of a selection bias: only firms with reliable forecasts disclose detailed forecasts. To discriminate between these two interpretations, we run a Heckman two-stage self-selection procedure. Empirical findings suggest that the selection bias is not significant.

The remainder of this paper is organized as follows. In section 2, we present some relevant institutional background on IPOs in France. Section 3 develops our research hypotheses. In section 4 we discuss our methodology and our sample selection. Section 5 presents our empirical results, and Section 6 discusses the results and presents research implications.

II. Forecast disclosures and IPOs in France

The first subsection describes the French IPO environment. Subsection 2 presents the financial disclosures required in IPO prospectuses.

A. Definition of IPOs

Flotation on the stock market through an initial public offering (IPO) is a major decision for a firm. Its main advantages for the firm are that it provides access to capital markets, makes the firm's value public and makes its name more widely-known. For the shareholder, too, especially the minority shareholder, the stock market, with its mandatory disclosures and equitable treatment requirements when majority stakes are sold, plus the incentive it provides for a coherent dividend policy, offers a degree of liquidity and protection that can never be had from any shareholder pact. But an IPO brings with it a certain number of constraints for the firm. Apart from the cost of information, which can be significant, it means the firm's strategy will be more dependent on financial parameters (such as PER, earnings per share, etc).

French firms can choose one of three stock markets for their IPO (*Premier marché* – the main market, *Second marché* – midcap market, *Nouveau marché* – for high-tech, high-growth stocks). We did not include *premier marché* IPOs as the firms concerned were too different from firms

launching IPOs on the other markets. Since IPOs on the *Premier marché* concern either much larger firms than those floating on the *Second marché* and *Nouveau marché*, or partial privatisations of nationalised firms, the firms involved are not comparable with our sample firms. The requirements for IPOs depend on the relevant market (see table 1), and concern features of the firm itself (size, age) as well as criteria related to the value of the issue or the level of information to be provided before and after the operation.

Insert table 1 about here

The financial intermediary handling the IPO must send out a prospectus containing information on the main features of the issue (number of shares offered, value of the firm, procedure) and the firm (its market, its strategy, its ownership structure, financial information) approximately one month before the date set for the IPO. The information required varies with the market (see table 1). Firms that choose the *Second marché*, generally assumed to be longer-established than those floating on the *Nouveau marché*, must supply more historical data, while their *Nouveau marché* counterparts will be required to report earnings forecasts.

B. Forecast Disclosures in IPO Prospectuses

The *Nouveau marché* and *Second marché* impose different requirements for forecast disclosures. The *Nouveau marché* was set up in 1996 to cater for young, fast-growing firms. The French stock market authorities require prospectuses for IPOs on this market to contain a section on the firm's investment policy, "in principle accompanied by figures giving a simplified presentation of the firm over three years, possibly expressed as a range, describing the major balance sheet items, main income statement items and cash flow statement"ⁱⁱ. This requirement is rather vague, prescribing no precise framework for the 'simplified presentation of the firm' or the format of

financial statements, and in practice, the content of the information disclosed by firms undertaking an IPO on the *Nouveau marché* varies very widely. Some firms present a forecast income statement, balance sheet and cash flow statement for the next three years or more, first describing the forecasting methods used; others simply publish a table of key forecast figures (net income, total sales). The level of detail in the forecasts disclosed varies

The *Second marché* is in principle designed for mature firms. Until 1996, it was very unusual for IPO prospectuses on the *Second marché* to contain forecast disclosures, but firms are now tending to publish such information voluntarily (Schatt and Roy 2002). Indeed, in our sample, almost all firms undertaking IPOs on the *Second marché* report forecast figures, even when not obliged by law to do so.

Past literature on voluntary disclosure before IPOs has concentrated on the relationship between voluntary forecast disclosures and forecast error or market performance, examining the question of whether voluntary earnings forecasts are associated with increased market rewards (because of a reduction in information asymmetry) or lower market rewards (because of the unreliability of forecasts). This paper takes a different approach. All firms that float on the *Nouveau marché* or *Second marché* disclose earnings forecasts, and we concentrate on the influence of the level of detail in earnings forecasts (detailed forecasts versus basic estimates). It could be considered that providing detail in forecast disclosures is effectively a voluntary disclosure for firms issuing shares on the *Nouveau marché* or on the *Second marché*ⁱⁱⁱ. In other words, we try to explore the determinants and consequences of the format used by managers to disclose earnings forecasts. Figure 1 presents the theme of this paper and the differences between our approach and previous literature in graphic form.

Insert figure 1 about here

We now turn to a more detailed discussion of past literature and our hypotheses.

III. Literature review and hypotheses

Earnings forecasts published in the prospectuses convey “insider” management information (Firth 1998), in that they inform investors, in particular, of how the IPO could affect the firm’s capacities to generate profit, due to development of new projects to be financed by the capital raised (Cheng and Firth 2000). This study comprises two stages. Our first aim is to understand the determinants of the level of detail in the forecast disclosures. The second stage examines the influence of the level of detail in forecast financial statements on forecast error.

A. Publication of Forecasts at the Time of IPOs

Agency and signalling theories can explain publication of voluntary disclosures in prospectuses. Watts (1977, p. 58), for example, considers that in an unregulated economy financial statements can be considered to reduce agency costs. He shows (1977, pp. 58-59) that in firms issuing new shares, management are keen to reduce agency costs by supplying information in the financial statements. But Watts does not specifically discuss voluntary forecast disclosures.

Ruland et al. (1990, p. 713) show that publication of earnings forecasts can attenuate adverse selection and moral hazard problems, thus making it easier to attract new capital. They show that firms increasing their capital with low retained ownership by pre-IPO shareholders publish more earnings forecasts. The incentive to do so should be high in France, where litigation risks are low (Djankov et al. 2003; La Porta et al. 2000) and could be expected to lead to a high level of disclosure.

Previous empirical work (e.g. Penman, 1980, Waymire, 1984, Pownall and Waymire, 1989) has documented that the release of managerial earnings forecasts is associated with changes in the stock prices of forecasting firms, suggesting that investors regard these forecasts as credible. Many studies (e.g. Penman 1980; Clarkson et al. 1991) refer to signalling theory to explain why earnings forecasts are published. They test the assumption underlying signalling theory, which suggests that firms with good news are likely to publish their earnings forecasts in order to differentiate themselves from firms with poor performances. Lev and Penman (1990) show that, on average, firms with good news to report do voluntarily disclose forecasts in order to distinguish themselves from firms with “worse news.” Hughes (1986) studies disclosures as a signal of the corporate value when there is high information asymmetry between investors and users regarding share price. In her model, the retained ownership rate (percentage of shares retained by the original shareholders) and disclosures act as signals of the firm’s value. Investors consider that the information disclosed is credible, as it is presumed that *“the entrepreneur is penalized if the ex post costlessly observable cash-flow of the firm indicates that the disclosure was fraudulent”* (Hughes 1986). All of these studies show that because of information asymmetry, owner-managers have an incentive to signal the firm’s value, particularly through earnings forecasts, to differentiate their IPO from those of lower quality firms.

These studies essentially examine what motivates firms to include profit forecasts in their IPO prospectuses (e.g. the desire to minimise agency and signalling costs). Mak (1996) extends the IPO research field by studying the determinants of forecast disclosures (not restricted to earnings forecasts) in IPO prospectuses. He tests the links between the level of forecast information (as measured by the number of years covered by the forecasts) and usual dependent variables (firm age, specific risk, etc). His study concerns New Zealand, an environment with low legal risks,

and shows that the greater the information asymmetry and/or the specific risk, the more forecasts are disclosed. The level of information is also negatively related to the rate of retained ownership. Our study takes a different perspective, as we focus on the level of detail in the forecasts disclosed. Agency and signalling theories and prior empirical evidence on the determinants of forecast disclosure during IPOs enable us to develop our hypotheses.

In order to test possible determinants of the level of detail in forecast disclosures for IPOs, five hypotheses are constructed with respect to the following potential determinants: forecast horizon, firm age, auditors' reputation, amount of capital increase and proportion of shares retained by the owners. We also introduce a control variable for firm size. The reasoning underlying our hypotheses is discussed below.

If the firm undertaking an IPO can supply profit forecasts over a fairly long timeframe, this is an indication that it knows its market relatively well and is presumably in a position to provide reliable forecasts. Also, to better justify the choice of a long timeframe, managers of issuing firms will tend to give more detailed information, because investors believe that managers will have more difficulty controlling events that happen later along that horizon (Mak 1996).

H1a: The longer the forecast horizon is, the more detail the forecasts will contain.

As the oldest firms have more control over their market, they are in a better position to provide reliable forecasts (Degeorge and Derrien 2001). According to signalling theory, this will generally lead them to supply more detailed forecasts in order to differentiate themselves from other firms entering the stock market (Hugues 1986).

H1b: The level of detail in forecasts rises with the age of the firm undertaking the IPO.

As Lee et al. (2003) have shown, the firms that provide the most forecast disclosures in their IPO prospectuses are those with the most highly-qualified auditors (i.e. member of a “Big Four” firm).

H1c: The level of detail in forecasts is positively associated with the firm’s auditor belonging to a “Big Four” network.

The more capital the firm wants to raise, the more it will have to attract external investors. In order to reduce information asymmetry, it is in management’s interest to publish reliable forecasts, i.e. with a certain level of detail (Degeorge and Derrien 2001).

H1d: The amount of the capital increase should be positively associated with the level of detail in the forecasts.

If the retained ownership (percentage of shares retained by the original shareholders) is low, then agency costs arise because potential investors may fear that the original shareholders are selling low-prospect shares. As a consequence, a low retained ownership rate should encourage management to publish earnings forecasts in order to reduce these agency costs (Ruland et al. 1990). Studies based on signalling theory show that a low retained ownership rate for an IPO can increase the use of other signals such as earnings forecasts (Hugues 1986). Both these theoretical fields (agency and signalling theories) therefore generally suggest that publication of forecasts is negatively associated with the rate of retained ownership by the original shareholders.

H1e: The percentage of shares retained by the original shareholders (retained ownership) is negatively associated with the level of detail in the forecasts.

Control variables: Firm size, IPO market, Industry sector and Year of IPO

The empirical evidence on the relationship between firm size and forecast disclosure is variable. Cox (1985) and Lev and Penman (1990), in examining forecast disclosure by listed firms, found a positive relationship; while Clarkson et al. (1991) and Mak (1996), focusing on IPO firms, found no significant relationship between size and forecast disclosure. In this study, firm size is included as a control variable in the determinants tests. We also control for the IPO market, the industry sector of issuing firm and for the year of IPO.

B. Profit Forecast Error after an IPO

In another stream of literature on forecast disclosures and IPOs, researchers have sought to estimate the quality of forecasts by studying the errors in profit forecasts. For IPO earnings forecasts to be credible and/or useful, they need to be accurate. A body of empirical research has therefore emerged that examines the accuracy of IPO earnings forecasts. After analysing determinants of the level of detail in the forecasts contained in IPO prospectuses, we study the quality of the forecasts, measured by the one-year ahead earnings forecast error. This study complements the literature on the difference between forecast and actual earnings following IPOs. Schatt and Roy (2002) assess the reliability of earnings forecasts included in prospectuses in France. They show that the forecasts in the prospectuses are more reliable than forecasts calculated using a time series model and that young firms, which are generally in the new technologies sector, publish less reliable forecasts than firms that are older or operate in other sectors. Ownership retention by original shareholders appears to be an important factor: the higher the retained ownership, the more accurate the forecasts.

Studies of earnings forecast error have also been carried out in New Zealand (Firth and Smith 1992), Australia (Lee et al. 1993) and Canada (Pedwell et al. 1994; Jog and McConomy 2003), where the errors were relatively significant compared to those observed in Malaysia (Jelic et al.

1998), Singapore (Firth et al. 1995) and Hong Kong (Chen et al. 2001)^{iv}. These articles used linear regression models to explain forecast reliability. The following independent variables were studied: the firm size, growth, forecast horizon, leverage, age, reputation of auditors, underwriters, issuers and market makers. Other than for the forecast horizon, the results on these independent variables were mixed.

The link between the level of detail in forecasts and forecast error has apparently never yet been tested. We assume that the level of detail in forecast disclosure is a signal of reliability in the published earnings forecasts. By providing a detailed framework for business forecasts, detailed information enables the manager to produce better forecasts.

H2: The greater the detail in forecasts contained in the IPO prospectus, the lower the forecast error.

In order to control for factors, other than the level of detail in earnings forecasts, that influence forecast error, six variables are introduced: initial forecast error, proportion of shares retained by the owners, amount of capital increase, firm age, firm size and leverage. We discuss the rationale for introducing these variables.

The greater the forecast error at the time of the IPO, the greater the error will be in the future. In this study we examine the forecast error the year following the IPO. We assume that forecast error is a self-cumulative phenomenon, i.e. the greater the forecast error the year of the IPO, the greater the error the following year.

Control variable 1: *The forecast error will be positively associated with the forecast error at the date of the IPO.*

The pre-IPO shareholders are more sensitive to market sanctions in the event of inaccurate forecasts, and this encourages them to devote more resources to establishing reliable profit forecasts. This argument is consistent with the signalling role for retained ownership suggested by Leland and Pyle (1977).

Control variable 2: *The forecast error will be lower for firms whose original shareholders retain a higher proportion of shares.*

The future cash flow generated by new projects financed by capital raised by the IPO is more difficult to estimate accurately (Degeorge and Derrien 2001).

Control variable 3: *The forecast error will grow with the amount of capital increase.*

The oldest firms have better control over their market, and their market forecasts are easier to establish. The profits of companies with a short or no prior operating history are likely to be more difficult to forecast, given the fact that historical data are very important inputs to the process of a forecast (Jelic, et al., 1998). Even if a new company were to rely on the operating history of other companies in the same or a related industry, the available information on the operating history of those companies is likely to be a less reliable predictor of future earnings than one's own operating history (Mak 1994). Jaggi (1997), examining a sample of 161 IPOs on Hong Kong, found that older companies were associated with smaller errors.

Control variable 4: *The forecast will be lower as firm age rises.*

Large companies are likely to have more influence over their market environment, as well as having more control over the level of their profits, i.e. over earnings volatility. Large firms also

tend to be more diversified, both geographically and in terms of their business. This could be another reason why volatility may be low. Firth and Smith (1992) found that company size had an unanticipated positive relationship with forecast errors, and Chen et al. (2001) showed that size is negatively related to the error measures. Nevertheless, Jelic et al. (1998) found that size is negatively but not significantly related to forecast error. Firm size is therefore included in this study as a control variable in the forecast error model, anticipating a negative sign.

Control variable 5: *Firm size and forecast error are negatively related.*

Previous empirical results on leverage are inconclusive. Chen et al. (2001), in Hong Kong, and Jelic et al. (1998), from Malaysia, found no significant relationship between the leverage of the company and forecast error. But profits of companies with high leverage are traditionally regarded as being more volatile and thus more difficult to forecast (Firth and Smith, 1992; Mohamad et al., 1994).

Control variable 6: *Leverage and forecast error are positively related.*

We also control for the industry sector of issuing firm, the IPO market and for the year of IPO.

IV. Sample and methodology

This section describes how the sample was developed and the methodology used.

A. Sample

Our sample includes 89 IPOs on the Euronext Paris *Nouveau marché* and *Second marché* between January 01, 2000 and December 31, 2002. We did not include *premier marché* IPOs as the firms on that market were too different. Since IPOs on the *premier marché* concern either much larger firms than those floating on the *Second marché* and *Nouveau marché*, or partial

privatisations of nationalised firms, the firms involved are not comparable with our sample firms^v. Of the 118 IPOs that took place over the period on the markets studied, we selected the 89 with prospectuses available in PDF format (on the AMF website) or on paper (from the AMF documentation centre), which represents 75% of the total IPOs of 2000, 2001, and 2002. All information on features of the issue, the firm (other than its financial statements), and forecasts is taken from these IPO prospectuses. It was first collected manually, then coded by another researcher for ten prospectuses to ensure coherence. Both codings generated identical results. The information concerning the financial and accounting aspects of the firms for the year of their IPO and the following years is taken from the DIANE database, which contains data for both listed and unlisted firms. This meant we could obtain financial statements for the year of the IPO. Of the 89 firms, the DIANE database only contained information (consolidated financial statements before and after the IPO) for 82 firms, i.e. 69% of the initial population.

Table 2 presents the financial information for sample firms. Their features are consistent with the market chosen. The *Second marché* attracts older firms, with higher leverage than those traded on the *Nouveau marché*. High-tech firms with major financing requirements tend to choose the *Nouveau marché*. The firms on this market are also more often audited by the big four firms. This may be due to the fact that firms undertaking IPOs on the *Nouveau marché* are often little-known, and want to confer credibility on their financial communication by engaging well-known auditors. However, firm size, the forecast horizon and the rate of retained ownership are similar on the two markets.

Insert table 2 about here

B. Measurement of Disclosure Level

The following procedure was applied to measure the quantity of forecast information published. Starting from an initial score of zero, each firm's score rises if it publishes forecasts. Five factors were taken into consideration:

- (1) Publication of a (simplified) forecast balance sheet: one point if one is published, zero otherwise.
- (2) Publication of a forecast income statement confers a score of between zero and two: zero if no income statement is published, one point if a simplified income statement is published, two points if a detailed income statement is published.
- (3) Publication of a cash flow statement: one point if one is published, zero otherwise.
- (4) If a table of key figures is included, the firm scores an extra point.
- (5) If details of assumptions are provided, the firm scores an extra point.

As seen in Panel A, Table 3, 28% of firms publish a forecast balance sheet, 51% a cash flow statement, 83% a table of key indicators and the same proportion disclose details of the assumptions used in a specific section. Concerning publication of a forecast income statement (data not tabulated), analysis shows that 18% of firms do not publish one, 43% publish one in the form of "key figures", and 39% publish a detailed income statement. There is no significant difference in the amount of disclosure between the *Second marché* and *Nouveau marché*.

Insert table 3 about here

Based on these data on disclosure or non-disclosure and their justification, three indicators of disclosure quantity can be constructed:

- *Score 1* is the sum of scores for each of the 5 items. A firm that discloses no forecasts would score zero, and the maximum possible score of 6 would correspond to a firm whose prospectus includes a detailed income statement, a balance sheet, a cash flow statement, key indicators and a section on assumptions.
- *Score 2* is a binary variable coded 1 if the *Score 1* score is higher than three. This is designed to discriminate between firms publishing little information (*Score 1* score under three) and firms publishing a lot of information (*Score 1* score of three or more). The main justification for using *Score 2* is that the statistical distribution of *Score 1* is strongly bi-modal. In other words, either firms disclose a considerable amount of information (*Score 2*=1), or they publish very little information (*Score 2*=0).
- *Score 3* is the score resulting from factorial analysis of the five disclosure items (balance sheet, income statement, cash flow statement, key indicators, section on assumptions).

Panel B, Table 3 shows that *Score 1* varies from one to six, with an average of 3.66 (median 4). The mean value of *Score 2* is 0.61: 61% of firms can be considered to disclose a considerable amount of information (*Score 2* = 1), and this overrepresentation of firms disclosing much information is confirmed by analysis of *Score 3*. The median for *Score 3* (0.35) is higher than the mean (which by construction is zero). Analysis of the disclosure quantity is relatively insensitive to the method used to aggregate items. The correlation coefficients between the three measures are very high and significant at 1%, as indicated in panel C, table 3. The rest of this paper uses *Score 2*. The rationale for choosing *Score 2* as the measure of forecast disclosures is that the information disclosed is binary in nature: either the firms chose to publish detailed forecasts or very brief forecasts, with almost no justification.

V. Empirical results

A. Research Design

The first stage studies the determinants of forecast disclosure in IPO prospectuses. As the variable studied (*Score 2*) is binary, a logit regression is used. Next, the influence of forecast disclosure quantity on earnings forecast error is examined. Our hypothesis is that the more disclosures a firm makes, the lower the earnings forecast error (difference between the reported earnings and expected earnings scaled by total assets) will be.

To assess the determinants of voluntary disclosure, we use the following model (logit regression):

$$\begin{aligned} Score2 = & \alpha_0 + \alpha_1 HORIZ + \alpha_2 AGE + \alpha_3 B4 + \alpha_4 INCCAP + \alpha_5 RET \\ & + \alpha_6 SIZE + \alpha_7 NM + \alpha_8 HT + \sum_k \alpha_{9,k} YEAR_k + \varepsilon_{i,t} \end{aligned} \quad (1)$$

With,

- *HORIZ* is the forecast horizon, measured by the number of forecast years.
- *AGE* is the firm's age, measured by: $\ln(\text{age in years})$
- *B4*, Audit quality, is a dummy variable coded 1 if one auditor at least is from: Arthur Andersen^{vi}, PriceWaterhouseCoopers, Ernst & Young, Deloitte or KPMG
- *INCCAP* is the capital increase measured by: $\ln(\text{collected funds in €}) / \text{lagged Total assets}$
- *RET* is the retained ownership, measured by: $(\text{number of shares after the IPO} - \text{number of shares issued} - \text{number of shares sold}) / (\text{number of shares after the IPO})$
- *SIZE* is the firm's size, measured by $\ln(\text{Total net assets})$.
- *NM*, *Nouveau marché*, is a dummy variable coded 1 if the firm's IPO is on the *Nouveau marché*; 0 otherwise.

- *HT*, High-tech industry, is a dummy variable coded 1 if the firm belongs to software, communication, phone, bio-tech industries; 0 otherwise.
- *YEAR* is a control variable for year of IPO.

The first five variables are used in the test of hypotheses H1a to H1e. Size, IPO market, industry sector (high-tech or other) and the year of the IPO are introduced as control variables.

The model of forecast error is as follows:

$$\begin{aligned} Error(N+1) = & \beta_0 + \beta_1 Score2 + \beta_2 Error(N) + \beta_3 RET + \beta_4 INCCAP + \beta_5 AGE \\ & + \beta_6 SIZE + \beta_7 LEV + \beta_8 HT + \beta_9 NM + \beta_{10} YEAR + \varepsilon_i \end{aligned} \quad (2)$$

With,

- *Score 2* is the level of voluntary disclosure, a dummy variable (0/1).
- *Error(N)* is the forecast error in year N, measured by: (Published income in N – forecast income in N)/Total assets.
- *RET* is the retained ownership, measured by: (number of shares after the IPO – number of shares issued – number of shares sold)/(number of shares after the IPO)
- *INCCAP* is the capital increase measured by: Ln (collected funds in €)/lagged Total assets
- *AGE* is the firm's age, measured by: Ln (age in years)
- *SIZE* is the firm's size, measured by Ln(Total net assets)
- *LEV* is a leverage ratio measured by the ratio of liabilities on total assets
- *HT*, High-tech industry, is a dummy variable coded 1 if the firm belongs to software, communication, phone, bio-tech industries; 0 otherwise.
- *NM*, *Nouveau marché*, is a dummy variable coded 1 if the firm's IPO is on the *Nouveau marché*; 0 otherwise.
- *YEAR* is a control variable for year of IPO.

The coefficient of interest is β_1 . Initial forecast error, retained ownership, firm age, capital increase, size, leverage, industry sector (high-tech or other), IPO market and year of IPO are introduced as control variables.

B. Regression Results

Table 4 presents the empirical results of the determinants study. Overall, the model proposed explains 42% of the variance (Cragg and Uhler's R^2). Only two variables emerge as significant: forecast horizon and firm age. The longer the firm's forecast horizon, the more detailed the information provided, which conforms to our hypothesis H1a. The older the firm (i.e. the longer it has existed), the more detailed its disclosures (H2a). The other variables are not significant. Collinearity diagnosis (calculation of VIF) does not indicate any significant problem (average VIF is 1.60, with maximum VIF of 2.09).

Insert table 4 about here

Table 5 presents empirical results on forecast error. The adjusted R^2 is 32%. We test two specifications of the model. All models are free of collinearity problems because the average VIF of the variables is 1.54, and no individual VIF is higher than 1.94. Qualitatively, the results are identical for both regressions.

Insert Table 5 about here

Model 1 is the base model. Four variables are significant at 10%:

- The coefficient for the *Score 2* variable is negative and significant. There are two non-exclusive interpretations for this finding. The first suggests that detailed disclosures reduce forecast error (hypothesis H2): by providing a detailed framework for business forecasting, detailed information enables the manager to produce better forecasts. This result may also reveal

a self-selection bias: it is possible that only firms with reliable forecasts disclose detailed information. We will discuss this issue below. Note however, that although the level of detail can be known as soon as the year of the flotation, the forecast error is known only one year after the IPO. This means that the level of detail signals positive future prospects.

- The forecast error for the previous year: the coefficient is positive, which suggests that forecast errors do not balance out from one year to the next. Statistically, this coefficient is not different from one, which means a forecast error in the initial year “carries over” from one year to the next.

- The retained ownership percentage (pre-IPO shareholders) influences the forecast error. The more old shareholders “remain”, the lower the forecast error (hypothesis H2c). This result is consistent with agency theory: if the “historical” shareholders are leaving the firm at the time of the IPO, it is in their interest to publish optimistic forecasts to push the new share price up.

- Forecast error grows with the amount of funds raised, suggesting that the larger the new projects financed by the IPO, the more difficult it will be to predict cash flows generated by these projects.

The other variables are not significant.

As outlined above, interpretation of β_1 is not straightforward. The negative association between the level of detail in forecast information and forecast errors may either be evidence that detailed information leads to less forecast error, or alternatively it may indicate the existence of a selection bias (only firms with reliable forecasts disclose detailed forecasts). Equation [2] is potentially mis-specified, if firms potentially self-select to disclose detailed or basic earnings forecasts based on factors that are associated with the relationship between current forecast error

(i.e. $Error(N)$ the year of the IPO) and future earnings forecast ($Error(N+1)$, the year following the IPO year). In particular, in Table 4 we show that detailed forecasters are older and forecast over a longer horizon than ‘basic’ forecasters. Since these factors potentially create endogeneity in the equation [2], we re-estimate the model controlling for endogeneity by using the method proposed by Chaney et al. (2004) and by Ball and Shivakumar (2005). Both papers consider the situation where a grouping variable (in our case *Score 2*) is endogeneous. We therefore estimate the model using the two-stage approach of Heckman (1979) and Lee (1979). In the first stage, we estimate the ‘level of detail’ choice equation as a probit model and, using the parameters from this model, we compute the inverse Mills ratio for all firms. In the second stage, we estimate the future earnings forecast error, including the inverse Mills ratio as an additional control. The inclusion of this variable acts as a control for endogeneity of *Score 2*.

The first stage therefore consists of a probit model, explaining the ‘level of detail’ choice as a function of firm age and the forecast horizon (the two variables that appear as significant in Table 4). The second stage is equation [2] augmented with the Inverse Mills Ratio [IMR]. Concentrating on the variable of interest (*Score2*), we find no change either in the magnitude (-0.513 versus -0.476) or the significance level ($p=0.019$ versus $p=0.017$) of the coefficient. The inverse Mills Ratio is not significant ($p=0.0175$). Taken together, these findings suggest that our results are not driven by self-selection.

VI. Conclusion

This study examines the relationship between the level of detail in forecast disclosures and the reliability of the earnings forecasts in the high information asymmetry environment of IPOs. We have successively studied two issues raised by forecast disclosures in IPO prospectuses: What are

the determinants of the level of detail in forecast disclosures? And: What is the impact of the level of detail on the earnings forecast error?

Our results on the determinants of forecast disclosure indicate that only firm age and forecast horizon present any positive, significant association with our measure of the level of detail in forecast disclosures contained in IPO prospectuses. These findings are in accordance with results from New Zealand, an environment where litigation risks are moderate (Mak 1996). Four variables explain the earnings forecast error: publication of detailed forecast disclosures and the rate of retained ownership by original shareholders reduced forecast error, whereas it rises as the capital raised and the initial forecast error increase. Two conflicting interpretations exist for the negative relationship between ‘detailed’ forecast disclosures and forecast error. First, this negative relationship may mean that disclosing detailed forecasts leads to less forecast error because forecasts are more reliable. On the other hand, it may indicate that only firms with reliable forecasts publish ‘detailed’ forecasts (self-selection bias). Our robustness check suggests that the former interpretation is appropriate.

This paper contributes to the literature in two ways. First, we present evidence that the way forecast information is disclosed in IPO prospectuses is of importance. This represents a shift compared to past empirical literature that focuses on the presence or absence of forecast disclosure. Second, we document a negative association between forecast error and the level of detail in forecast disclosures. This hypothesis test is entirely new and shows that disclosure of detailed forecast information could lead to a smaller forecast error or signal companies with reliable forecasts. This result reinforces the role of financial disclosures as a means to reduce information asymmetry. This research could have implications for stock market regulators, as it suggests that mandatory disclosure of highly detailed forecasts would improve the efficiency of the markets by reducing forecast error.

The paper suffers from at least two potential flaws. First, omitted variables, such as the possession of good news or proprietary costs, can influence both forecast errors and the level of detail of forecasts. However, the measurement of such variables is difficult and their inclusion in our regressions might have raised new issues (e.g. measurement error in independent variables, colinearity, etc). Second, the negative association between the level of detail in forecast information and forecast errors may either show that detailed information leads to less forecast error or reflect a self-selection bias (only firms with reliable forecasts disclose detailed forecasts). In this paper we have preferred the causality view, but despite our robustness check the self-selection bias explanation cannot be completely ruled out.

These limitations could provide the basis for future research, examining the links between earnings management and the level of detail in forecast information can be studied, or the influence of the management over-optimism bias on the disclosure of detailed forecasts (Elliott et al. 1995).

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Table 1 – IPO criteria

Market		<i>Second marché</i>	<i>Nouveau marché</i>
Company profile		Medium-sized international firms	High growth potential international firms
Criteria concerning the issue: % of equity, value, number of shares		10% of shareholders' equity, € million	20% of shareholders' equity, minimum of 10,000 shares, € million, capital increase of 50% of the funds raised by the IPO
Criteria concerning financial indicators		Market capitalization: €30 million, 3 years old, auditor-certified financial statements	Shareholders' equity: €1.5 million
Mandatory disclosures in the IPO's prospectus concerning...	...past performance	3 last consolidated financial statements under French rules, IFRS or US GAAP plus reconciliation to French standards	Consolidated financial statements if available, last 3 certified financial statements, last positive income statement
	...forecast information	No compulsory disclosures	3 years of forecast statements
Mandatory disclosures after the flotation		Quarterly sales, half-yearly progress report, annual report	As <i>Second Marché</i> + market maker's analytical report over 3 years, quarterly income and cash-flow statements

Source: Euronext web site

Table 2 – Sample characteristics

Variable	Definition	Total sample <i>Nouveau marché</i> <i>Second marché</i>						Tests	
		Mean	Med.	Mean	Med.	Mean	Med.	Mean	Med.
AGE	Ln(age)	2.04	2.20	1.85	1.79	2.38	2.52	0.09 (*)	0.04 (**)
LEV	Leverage ratio	0.12	0.06	0.06	0.01	0.22	0.19	0.00 (***)	0.00 (***)
HT	High-tech firms (0,1)	0.22	0.00	0.33	0.00	0.03	0.00	0.00 (***)	0.00 (***)
INCCAP	Ln(Capital increase)	0.70	0.54	0.93	0.60	0.33	0.29	0.06 (*)	0.00 (***)
B4	Auditor B4 (0,1)	0.55	1.00	0.65	1.00	0.38	0.00	0.01 (***)	0.00 (***)
SIZE	Ln(Total assets)	10.51	10.39	10.44	10.38	10.61	10.57	0.37	0.93
RET	Retained ownership (%)	0.74	0.76	0.75	0.78	0.73	0.71	0.38	0.08 (*)
HORIZ	Forecast horizon	2.52	3.00	2.61	3.00	2.34	3.00	0.31	0.33

* significant at 10%, ** significant at 5%, *** significant at 1%.

Significance levels are two-tailed. The last two columns report the p-levels of tests of equality of means and medians between the *Nouveau marché* and the *Second marché* for each variable.

Table 3 – Forecast disclosure indexes and test of equality by issuing market (*Second Marché* versus *Nouveau Marché*)

Variable	Mean	Standard deviation	Median	Tests of	
				Equality of means (t-tests)	Equality of medians (Mann-Witney test)
Panel A: Presence of forecast elements					
Balance sheet (0 or 1)	0.28	0.45	0	0.6316	0.6289
Income statement (0, 1 or 2)	1.21	0.73	1	0.726	0.8788
Cash flow statement (0 or 1)	0.51	0.5	1	0.9376	0.937
Key indicators table (0 or 1)	0.83	0.38	1	0.4168	0.4136
Section on assumptions (0 or 1)	0.83	0.38	1	0.1615	0.1602
Panel B: Scoring of forecast information					
Score 1 (= sum of items)	3.66	1.86	4	0.6552	0.8893
Score 2 (= dummy variable)	0.61	0.49	1	0.7945	0.7928
Score 3 (= factor analysis)	0	1	0.35	0.4509	0.8739
Panel C: Scoring convergence					
	Score 1	Score 2	Score 3		
Score 1 (= sum of items)	1				
Score 2 (= dummy variable)	0.9721 ***		1		
Score 3 (= factor analysis)	0.7055 ***	0.7317 ***	1		

* significant at 10%, ** significant at 5%, *** significant at 1%.

Table 4 – Determinants of forecast disclosure

$$Score2 = \alpha_0 + \alpha_1 HORIZ + \alpha_2 AGE + \alpha_3 B4 + \alpha_4 INCCAP + \alpha_5 RET + \alpha_6 SIZE + \alpha_7 NM + \alpha_8 HT + \sum_k \alpha_{9,k} YEAR_k + \varepsilon_{i,t}$$

	Predicted sign	b	t	p
<i>HORIZ</i>	+ (H1a)	1.430	(3.788)	0.000
<i>AGE</i>	+ (H1b)	0.881	(2.323)	0.020
<i>B4</i>	+ (H1c)	0.385	(0.535)	0.593
<i>INCCAP</i>	+ (H1d)	1.759	(1.391)	0.164
<i>RET</i>	+ (H1e)	2.645	(1.074)	0.283
<i>SIZE</i>	?	0.539	(1.057)	0.291
<i>NM</i>	?	-0.420	(0.511)	0.610
<i>HT</i>	?	-0.340	(0.450)	0.653
<i>YEAR 2000</i>	?	-0.732	(0.903)	0.366
<i>YEAR 2002</i>	?	0.602	(0.431)	0.666
<i>Constant</i>		-13.014	(1.866)	0.062
Chi 2		33.994		
p(chi2)		0		
# of observations		82		
Gragg & Uhler'sR-2		0.42		

HORIZ is the forecast horizon, measured by the number of forecast years; *AGE* is the firm's age, measured by: Ln (age in years); *B4*, Audit quality, is a dummy variable coded 1 if one auditor at least is from: Arthur Andersen, PriceWaterhouseCoopers, Ernst & Young, Deloitte or KPMG; *INCCAP* is the capital increase measured by: Ln (collected funds in €)/lagged Total assets; *RET* is the retained ownership, measured by: (number of shares after the IPO – number of shares issued – number of shares sold)/(number of shares after the IPO); *SIZE* is the firm's size, measured by Ln(Total net assets); *NM*, *Nouveau marché*, is a dummy variable coded 1 if the firm's IPO is on the *Nouveau marché*; 0 otherwise; *HT*, High-tech industry, is a dummy variable coded 1 if the firm belongs to software, communication, phone, bio-tech industries; 0 otherwise; *YEAR* is a control variable for the year of the IPO.

Table 5 – Forecast error

$$Error(N+1) = \beta_0 + \beta_1 Score2 + \beta_2 Error(N) + \beta_3 RET + \beta_4 INCCAP + \beta_5 AGE + \beta_6 SIZE + \beta_7 LEV + \beta_8 HT + \beta_9 NM + \beta_{10} YEAR + \varepsilon_i$$

	Predicted	Model 1			Model 2		
	Sign	b	t	p	b	t	p
<i>Score 2</i>	- (H2)	-0.467	(2.442)	0.018	-0.494	(2.436)	0.019
<i>Error N</i>	+ (PL)	0.833	(4.671)	0.000	0.879	(4.838)	0.000
<i>RET</i>	- (PL)	-2.609	(1.930)	0.059	-2.621	(1.909)	0.062
<i>INCCAP</i>	+ (PL)	0.108	(3.127)	0.003	0.110	(3.293)	0.002
<i>AGE</i>	- (PL)	0.088	(0.803)	0.426	0.047	(0.489)	0.627
<i>SIZE</i>	- (PL)	-0.164	(1.561)	0.125	-0.175	(1.705)	0.095
<i>LEV</i>	+ (PL)	0.426	(0.597)	0.553	0.517	(0.774)	0.443
<i>HT</i>	?	-0.304	(1.325)	0.191	-0.312	(1.348)	0.184
<i>NM</i>	?	0.425	(1.476)	0.146	0.391	(1.263)	0.213
<i>YEAR 2000</i>	?	-0.678	(2.196)	0.033	-0.695	(2.205)	0.032
<i>YEAR 2002</i>	?	0.085	(0.455)	0.651	0.026	(0.139)	0.890
<i>IMR</i>					-1.013	(0.853)	0.398
<i>Constant</i>		3.566	(1.885)	0.065	3.719	(1.984)	0.053
<i>R²</i>		0.359			0.367		
<i># of observations</i>		82			82		

PL: from previous literature. *Score 2* is the level of voluntary disclosure, a dummy variable (0/1); *Error N* is the forecast error in year N, measured by: (Published income in N – forecast income in N)/Total assets; *RET* is the retained ownership, measured by: (number of shares after the IPO – number of shares issued – number of shares sold)/(number of shares after the IPO); *INCCAP* is the capital increase measured by: Ln (collected funds in €)/lagged Total assets; *AGE* is the firm's age, measured by: Ln (age in years); *SIZE* is the firm's size, measured by Ln(Total net assets); *LEV* is a leverage ratio measured by the ratio of liabilities on total assets; *HT*, High-tech industry, is a dummy variable coded 1 if the firm belongs to software, communication, phone, bio-tech industries; 0 otherwise; *NM*, *Nouveau marché*, is a dummy variable coded 1 if the firm's IPO is on the *Nouveau marché*; *YEAR* is a control variable for year of IPO.

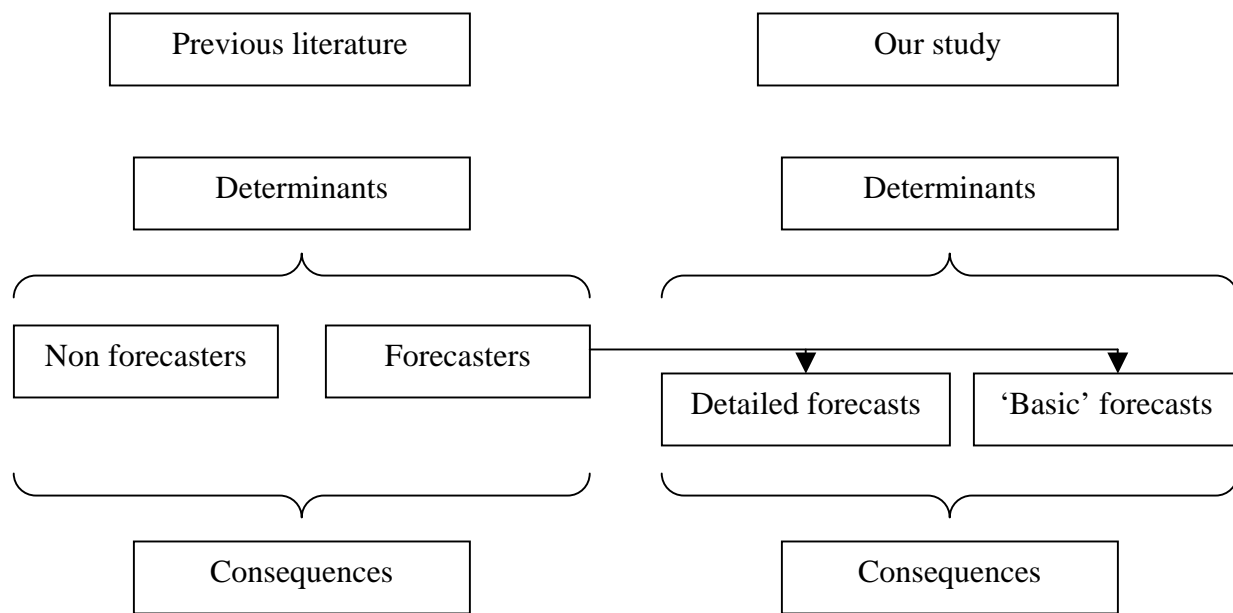


Figure 1: voluntary disclosure before IPOs

ⁱ Euronext is the pan-European stock market common to Paris, Amsterdam, Lisbon and Brussels.

ⁱⁱ Translated extract from the AMF's Instruction of December 2001 in application of COB regulation 95-01. In 2003, the COB (*Commission des Opérations de Bourse*) merged with the CMF (*Conseil des Marchés Financiers*) to become the AMF (*Autorité des Marchés Financiers*).

ⁱⁱⁱ Although the regulatory body requires forecasts to be disclosed on the *Nouveau marché*, it does not specify the form of that forecast and the level of detail contained. Consequently, detailed forecast disclosure on the *Nouveau marché* could be considered a form of voluntary disclosure.

^{iv} Forecast disclosure is allowed in Australia, New-Zealand and Hong Kong, and mandatory in Malaysia and Singapore.

^v 25 firms undertook an IPO on the *premier marché* in 2000, 2001 and 2002: 7 are formerly state-owned firms that were privatized, 18 are large firms previously privately owned either by individuals (e.g. JC Decaux) or by investment funds (e.g. *Générale de Santé*).

^{vi} In France, Arthur Andersen merged with Ernst & Young in 2002.